

Application No. 10/614,244
Amendment dated February 3, 2006
Reply to Office Action of October 5, 2005

Docket No.: 21776-00052-US1

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all previous versions and listings of claims in this application.

Claim Listing:

Claims 1-2: (Canceled).

3. (Previously Presented) An apparatus for removing a resist film used in a lithographic process, said apparatus comprising:

means for spraying saturated steam onto said resist film,

wherein said resist film is peeled off by an action of said saturated steam.

4. (Previously Presented) An apparatus as set forth in claim 3, wherein the temperature of said saturated steam at the target surface is within the range of 70° to 100°C.

Claims 5-22: (Canceled).

23. (Currently amended) ~~An apparatus as set forth in claim 20~~ The apparatus of claim 3, further comprising at least one of:

means for making water act on said resist film;

means for making vapor of isopropyl alcohol act on said resist film;

means for making compressed carbonic acid gas act on said resist film;

means for adding a chemical ingredient into said steam and/or said water;

means for irradiating said resist film with ultraviolet rays;

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means for applying high-frequency supersonic waves to said resist film; and

means for cooling a substrate on which said resist film is formed,

wherein said resist film is peeled off by properly combining at least one of time and/or spatial conditions, conditions on temperature, and physical and/or chemical conditions for operating each of said means.

Claims 24-25: (Cancelled).

26. (New) An apparatus for removing a photoresist film from a substrate, the apparatus comprising:

a steam generator;

a process chamber;

a spinning mechanism arranged within said process chamber and adapted to hold and rotate the substrate;

a nozzle arranged to direct steam onto said substrate and said photoresist film;

wherein rotation of said spinning mechanism cooperates with directed steam to remove said photoresist film from the substrate.

27. (New) The apparatus of claim 26, wherein said nozzle comprises a line slit nozzle disposed in a radial direction relative to a surface of the spinning mechanism.

28. (New) The apparatus of claim 26, further comprising a water supply that passes water through a high-frequency supersonic oscillator and a water spraying nozzle onto the substrate.

29. (New) The apparatus of claim 28, further comprising a chemical injecting device

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arranged to inject a chemical treatment into both of said steam generator and said water supply.

30. (New) The apparatus of claim 26, further comprising a chemical injecting device arranged to inject a chemical treatment into said steam generator.

31. (New) The apparatus of claim 26, further comprising an ultraviolet (UV) lamp that exposes a surface of the photoresist film to UV radiation.

32. (New) The apparatus of claim 26, further comprising a substrate cooling plate arranged on the spinning mechanism.

33. (New) The apparatus of claim 26, further comprising a spraying nozzle arranged to spray a gas into the process chamber.

34. (New) The apparatus of claim 33, further comprising a source of compressed carbonic acid gas, wherein the spraying nozzle is arranged to spray the carbonic acid gas into the process chamber.